Early Journal Content on JSTOR, Free to Anyone in the World

This article is one of nearly 500,000 scholarly works digitized and made freely available to everyone in the world by JSTOR.

Known as the Early Journal Content, this set of works include research articles, news, letters, and other writings published in more than 200 of the oldest leading academic journals. The works date from the mid-seventeenth to the early twentieth centuries.

We encourage people to read and share the Early Journal Content openly and to tell others that this resource exists. People may post this content online or redistribute in any way for non-commercial purposes.

Read more about Early Journal Content at http://about.jstor.org/participate-jstor/individuals/early-journal-content.

JSTOR is a digital library of academic journals, books, and primary source objects. JSTOR helps people discover, use, and build upon a wide range of content through a powerful research and teaching platform, and preserves this content for future generations. JSTOR is part of ITHAKA, a not-for-profit organization that also includes Ithaka S+R and Portico. For more information about JSTOR, please contact support@jstor.org.

Amherst, Mass. with the query "What are the New England localities of this rare plant?" During 1859-60 I found it in the vicinity of Bangor, Me., on land newly cleared and burnt over, growing as abundantly as erechthites or any of the "fire weeds," many acres being entirely covered with it.

Making a trip subsequently to Mt. Katahdin, nearly one hundred miles north from Bangor, I found it abundantly, at intervals, in clearings, all along the route. But I have never found it elsewhere in New England.—J. W. CHICKERING.

[It is known to occur in Brunswick, Maine.—EDITORS.]

THE USES AND ORIGIN OF THE ARRANGEMENTS OF LEAVES IN PLANTS.—A paper by Chauncey Wright, with the above caption, appears in the last part (vol. ix, part ii) of the Memoirs of the American Academy of Arts and Sciences. It is a philosophical and exceedingly interesting discussion of the subject, and we shall endeavor to bring it to the notice of our readers in a subsequent number.

ZOOLOGY.

SPONTANEOUS DIVISION IN STARFISHES.— Mr. C. Lütken, of Copenhagen, so well known for his important researches on the natural history of certain groups of the Echinoderms, has recently laid before the Royal Academy of Copenhagen the results of some very interesting and valuable investigations on the spontaneous division of the starfishes and brittle-stars. Professor Verrill has recently described a new genus of brittle-star (*Ophiothela*), all the known species of which possess a number of arms greater or less than five, generally six, and in some few instances three or two; very rarely indeed does the normal number of five make its appearance. Lütken describes a new species of this genus (*O. isidicola*) on a certain number of specimens of which he finds six nearly equal arms, but in the majority of these specimens there is a marked difference between the three arms on one side of the body and the three arms on the other; in another set the difference is still more marked, the one set of three arms being quite small and the other of the ordinary size. In others, again, this difference is extended to the disk itself, and it looks as if it had been cut in two by a knife. In all these cases there can be little doubt that these appearances result from a primary division and then a regeneration of the parts that had been divided off. It becomes an interesting question how often such division could take place in any individual; without being able to pronounce any positive opinion on this point, Lütken inclines to the belief that up to a certain age it can be repeated several times. Allowing that the faculty of regeneration is very great among the ophiuroids (a disk of an ophiura deprived of all its arms will sometimes under favorable circumstances renew them all), still the phenomenon witnessed in *Ophiothela* differs from a mere casual renewal of lost parts of an accidental lesion; there is a regularity and symmetry about it which certainly points to a true natural spontaneous division having for its object the multiplication of the individual. It must not be forgotten, moreover, that Profs. Steenstrup and Sars have observed the same phenomena in certain small ophiuroids with six arms, especially among species of the genus *Ophiactis* that live intertwined among corals and sponges, nor that the truth of their observations has been confirmed by Lütken himself. In one or two species of another genus, *Ophiocoma* (*O. pumila*), the same thing occurs; in these instances it becomes clearly apparent that in young individuals only this agamic form of reproduction takes place, and that with the adult forms the results of the division are truly sexual. Similar phenomena have been remarked in certain *Asteridæ*, notably in *Asterias problema* Stps., and in some allied species described by Verrill, as well as in *Linckia ornithopus* and *Ophidiaster cribrarius*. Lütken is of opinion that though there are many cases where the spontaneous division is merely gemmation more or less disguised, there are likewise many instances in which it is, so to speak, simple division and nothing else. In the case of the ophiuroids and asteroids he inclines to think it a normal form of multiplication, which takes the place of gemmation. It would have a near relationship to the power of regeneration on the one hand, and to that of gemmation on the other; and while it may not always be possible to clearly define the exact limits of these "powers," it is convenient to preserve to "Schizogony" an independent place among the different forms of agamic multiplication. The classifying of the phenomena above alluded to as occurring in the ophiuroids and asteroids in the category of "Schizogony," conclusively indicates, in short, that there is in this spontaneous division something altogether different from gemmation. The following general propositions are laid down by

Lütken: — 1. The most energetic manifestation of the faculty of regeneration in animals is the power of divisibility; 2. In certain forms of Radiates, in which the faculty of regeneration is very highly developed, spontaneous division takes place only, as in ophiuroids and asteroids, or together with gemmation as in Actinia; 3. Actual spontaneous division or schizogony in the Actinia, Medusa, asteroids and ophiuroids, which must not be confounded with the disguised form of gemmation met with in Infusoria and certain heteropods, may be regarded as a peculiar form of agamic reproduction, such as Blastogony, Sporogony and Parthenogony. — *Nature.*

Habits of a Species of Sorex. — As far as my observation goes this is the most diminutive animal among the quadruped type. It is the musk — I had like to have said mouse — but except the incisors, it resembles the Talpa family more than it does the Mus. They are rather rare. Indeed until the present year I had never seen one of them. They dwell in warm nests, made of grass, under rocks, old logs, or old castaway rails, about the fences or edges of the prairie. They do not come about the houses, and are purely nocturnal. I have found only three nests of them. They have four young at a time, which they nurse and care for most affectionately. I had a family of them and fed them a week, where I could observe all their actions. I had the father and mother and their four half-grown offspring. They were pretty pets, and I had hoped to succeed in sending the whole family to you, but our cherished hopes are often frustrated. The male made his escape, and finding another newly married pair — they do marry, and as far as I can learn, stick together as long as they both live — I put them into the box with my half civilized family. The male instantly caught a young one and was aiming to kill it, when I put him and his companion into an empty oyster can, and setting it back in the box, went to supper. When I returned, I found that the ferocious rascally male had made shift to get out of the can, and had murdered all the young ones. I was very sorry for the loss, and thinking he had done all the mischief he could, turned his wife out of the oyster can, and left them in the box with the bereaved and deeply afflicted mother. Next morning I found they had murdered the sorrowing mother and had eaten her very nearly up. These last two captured cannibals I have sent you. The young are born blind, and remain so until they are half grown certainly, perhaps longer. The male seems to care for and assist in rearing the young. He will go out and capture a grasshopper or cricket, carry it home and give it to his nursing companion. All the actions, one to the other, of a married couple, indicate in the untrammelled state, much affection and caressing attention. No bear or panther could manifest a greater degree of ferocious destructiveness than does the male of this diminutive tribe of animals when he is molested by his kind, or when he comes in contact with a rival. The odor emanating from the box in which I kept them, when the box is clean, is dilute musk, with a slightly sweet accompaniment. They have their young about the 10th of February, that is, as far as my observation goes. How long their period of gestation, or how often they produce their young, is not yet known to me. They sleep all day. I have had opportunity to make observation on the action of four half and four full-grown specimens, some of them through a period of twenty days. The results are recorded above. I wish you to examine them and give me their name and tell me to what families they are allied. —*Abstract of a letter to the Smithsonian Institution by* G. LINCECUM, *Long Point*, *Texas*.

ALEUTIAN CEPHALOPODS.—In the winter of 1871–2 at Ilinlink, Unalashka, a large number of giant cuttles were stranded at various times. One of these, a species, apparently, of *Pinnoctopus*, measured six feet from tip to tip of the arms, which were much mutilated, or about fifty-two inches from the posterior extremity of the body to the ends of the arms as they remained. The color was white, ocellated with brick-red and the larger suckers measured twenty-five inches across.

A still more remarkable form, however, was subsequently obtained, perhaps the *Onychoteuthis Bergi* Licht., one specimen of which measured from the posterior end of the body to the mutilated ends of the tentacular arms one hundred and ten inches with a body girth of nearly three feet, and weighing nearly two hundred pounds. Another specimen more mutilated measured eighty inches in length. The larger one could hardly have been less than ten feet long when perfect, the pen measuring sixty-one inches. The buccal mass containing the jaws was about the size of a small orange. The *Octopus punctatus* Gabb, which occurs at Sitka abundantly, reaches a length of sixteen feet or a radial spread of nearly twenty-eight feet, but the whole mass is much smaller than that of the decapodous cephalopods of lesser length. In the Octopus above mentioned, the body would not exceed six inches in diameter and a foot in length, and the arms attain an extreme tenuity toward their tips.

There can be no doubt whatever that some cephalopods in the warmer seas attain an enormous bulk as well as length. Capt. E. E. Smith, an experienced sperm whaler, and a careful and intelligent observer, informs me that he has seen portions of "squid" arms vomited up by the whales in their death agony, as large as a "beef barrel," with suckers on them "as big as a dinner plate." I have no doubt of the correctness of this statement. Mr. Henry G. Hanks, of the San Francisco Microscopical Society, reports having seen, when on a voyage in a trading schooner among the South Sea Islands, a cuttlefish near the surface of the water, "as large as the schooner!" While this is rather indefinite still it indicates that specimens much larger than any yet recorded may probably exist in those regions. I have also rather vague reports of some enormous squid which have been observed in the Gulf of California.—W. H. Dall.

Criticism on an Observation of Professor Thomson on Certain Sponges, etc.—On looking over the "Depths of the Sea" by Prof. Wyville Thomson (Macmillan and Co., 1873), my attention was called to an observation which, when taken in connection with what had been said a few pages previously, seemed to me to do great injustice to our distinguished naturalist, Dr. Leidy. In the March number of the American Naturalist for 1870 there appeared "Remarks on some curious Sponges," by Prof. Leidy. In this article, after calling attention to the views of the nature of the sponge, Hyalonema, as offered by Gray, Valenciennes, Milne-Edwards, Brandt, Bowerbank, Schultze, and Ehrenberg, Dr. Leidy observes, "Prof. Schultze regards the sponge mass as situated at the bottom of the fascicle, and its flattened extremity with the large oscules at the base. This appears to me to be the general view, but it has occurred to me that the sponge mass in its natural position was uppermost and was moored by its glassy cable, or rope of sand, to the sea bottom; perhaps to marine algæ. This opinion is founded on the circumstance that in sponges generally the large oscules from which flow the currents of effete water are uppermost. The ends of the threads of the fascicle, with their reversed hooklets, are also well adapted to adhere to objects." Prof. Leidy, then noticing that the "beautiful Euplectella of the Philippines was also at first represented upside down," concludes by giving a clear description of the Pheronema, a sponge "apparently intermediate in character with Hyalonema and Euplectella—(which would) "appear to throw some light upon the question of what belongs to Hyalonema."

The observation of Prof. Thomson, to which I have referred, will be found on page 426, and is as follows: "Perhaps the most singular circumstance connected with this discussion was that all this time we had been looking at the sponge upside down, and that it had never occurred to any one to reverse it." Reading this quotation by itself one would naturally suppose that Prof. Thomson had simply been ignorant of what Dr. Leidy had already published, but at page 418 of the same work, "the Depths of the Sea," in describing a sponge resembling Holtenia, Prof. Thomson remarks "I was inclined at first to place this species in the genus Pheronema, but Dr. Leidy's description and figure," etc. Evidently, then, Prof. Thomson was familiar with what Dr. Leidy had published in reference to these sponges. Why therefore does he unjustly ignore the fact that Dr. Leidy was the first to describe correctly the position of Hyalonema by saying "we had been looking at the sponge upside down and that it had never occurred to any one to reverse it." We trust that Prof. Thomson will now gracefully throw up the sponge.—Henry C. Chapman.

Embryology of the Lepidoptera.—The distinguished Russian embryologist, Prof. A. Kowaleusky, gives us in a late memoir (Embryological studies on Worms and Anthropods, St. Petersburg, 1871), the first definite information we possess as to the mode of development of the Lepidoptera. He finds that development goes on very uniformly in very remote genera. The primitive band is confined to one side of the egg and sinks a little way into the yolk; it is thus an endoblast, as Dr. Dohm had previously stated from the observations of Herold. The outer membrane, which surrounds the yolk, and is developed from the primitive blastoderm (the amnion of most authors), is called the "serous membrane," by Kowaleusky, while the inner membrane, which arises from the primitive band, and apparently corresponds to the "faltenblatt" of Weismann and others, he calls the "amnion." Scarcely has the primitive band sunk down into the yolk, than it immediately greatly increases in size and length, until from being only twice as long as broad, and confined to one side of the egg, it surrounds the yolk. At this time the segments are indicated, and the rudiments of the appendages of the head and thorax appear. At a little later stage, the rudiments of ten pairs of abdominal feet appear, corresponding to the number of abdominal segments (in Sphinx). Ten abdominal segments may be set down then as the normal number in the Lepidoptera. The embryo with fully formed organs remains surrounded by the yolk, which it "gulps down its mouth parts, which meanwhile have been perfected." It then devours the "amnion," and finally the external "serous membrane." It has now obtained its characteristic colors and hairs, and lies curled up on its ventral side until it gnaws through the chorion and effects its escape from the egg-shell. From Kowalevsky's observations, we should judge that the Lepidoptera at first, though differing in some important respects from other insects, in others develop like Libellula, Telephorus and the Hemiptera and other endoblasts. In this respect, perhaps of not much importance, the development of the Lepidoptera is quite different from that of the Phryganeidæ. This, perhaps, indicates that there has been no genetic relation between the moths and caddis flies. Later, after the germ is formed, with indications of segments, the embryo resembles that of Diptera and Hymenoptera.—A. S. P.

THE PURRING OF THE CAT.—Since the vocalization of rodents has lately been a subject of study, it has occurred to me to inquire into that of one of their mortal enemies. Has any one expounded fully the mechanism of the purring of a cat?

The facts are these. The purr is a double or *to and fro* sound; it accompanies the breathing of the animal and is a respiratory phenomenon. It is in fact a vocalization, with the mouth closed. The vibration attending it is felt all over the chest and no farther, except in the throat.

On auscultation of a pussy during the purr, I found a very musical rumbling sound permeating the lungs throughout. Its character is changed, however, when the larynx is compressed; becoming higher as the voice does with narrowing of the glottis.

The vibration is also coarser to the ear in the throat than elsewhere. It reminds one there of the rattle connected with excessive secretion of mucus in the wind-pipe. But, as there is no liquid present, I ascribe the sound principally to a rough vibration of the epiglottis; supplemented no doubt, by an exaggerated vesicular murmur in the lungs, caused by a quivering, semi-convulsive mode of action of the respiratory muscles.

Perhaps all this may be familiar to most people, and I may have been before very unobservant in supposing the purring to be a general tremor of the whole body, having no connection with the breathing process.

Since writing the above note I have looked through a number of physiological works, without finding anything about "purring;" but at last, in the "Cyclopædia of Anatomy and Physiology," find the following remarks (Article Voice, Vol. iv, p. 1490):—

"The whole of the feline order [*sic*] are remarkable for the prominence of the superior ligaments of the larnyx, by which the purring is most probably produced. Vicq. d'Azyr ascribed the purring of the cat to two thin membranes situated beneath the inferior ligaments; but we [J. Bishop] were unable to detect them; nor could Cuvier, Wolff, Casserius and others, succeed in finding them."

This shows that the vocal nature of purring has been observed. I am sorry not to be able to refer to the memoir of Vicq. d' Azyr "On the Anatomy of the Vocal Organs in Mammals," 1779, to find whether he goes into detail in regard to it. Probably, in an anatomical treatise he does not.

THE "WILLOW WANDS" FROM BURRARD'S INLET.—Some peculiar specimens from British Columbia, resembling peeled willow switches were exhibited at the last meeting of the British Association, and were commented on in "Nature" and elsewhere by naturalists, among whom, Dr. P. L. Sclater (on the authority of some sea captain who stated that they were derived from a *fish*) suggested that if the statement were correct they might be the hardened notochord of some unknown fish. Several of the gentlemen referred to suggested that these organisms were the axes of alcyonoid polypes allied to *Pennatula* or *Virgularia*, and Mr. R. E. C. Stearns, in a paper lately read before the California Academy of Sciences, took the same view, suggesting that they might be allied to *Umbellularia*. That this view is the correct one, and that the supposed fish was only a "fish story," there can be no doubt whatever. Very lately, Mr. Hemphill has forwarded to the California Academy of Sciences some dry *Virgularias* (?) from San Diego, California. Although the genus cannot be determined without alcoholic specimens, yet the axes of these specimens, which are about a foot long, present no differences whatever except in size, from the Burrard's Inlet specimens, of which the Academy possesses a large series. Mr. Hemphill adds in a letter to Mr. Stearns, to whom I am indebted for this information, that these animals, though not attached to anything, are quite hard to pull out of the mud, and that they descend into it at low water, protruding the upper portion of the polypidom only at high water. It is manifestly improbable that the Burrard's Inlet species, which attains an axial length of six feet, can thus conceal itself, and this would confirm the reports which have been circulated here, that it is found only in deep water.— W. H. D.

ABSENCE OF EYES IN CRUSTACEA.—In connection with the subject of cave life and the probable derivation of the blind crayfish of Mammoth cave from ancestors able to see, we would refer our readers to the following remarks of Prof. Wyville Thomson in "Nature," May 15, on *Deidamia leptodactyla* von Suhm, dredged in lat. 21° 38′ N., long. 44° 39′ W. in 1900 fathoms. It is allied to Astacus, but differs from all the typical decapods in the total absence of eye-stalks and eyes.

"The absence of eyes in many deep-sea animals and their full development in others is very remarkable. I have mentioned ("The Depths of the Sea," p. 176)., the case of one of the stalk-eyed crustaceans *Ethusa granulata*, in which well-developed eyes are present in examples from shallow water. In deeper water, from 110 to 370 fathoms, eye-stalks are present, but the animal is apparently blind, the eyes being replaced by rounded calcareous terminations to the stalks. In examples from 500 to 700 fathoms in another locality, the eye-stalks have lost their special character, have become fixed, and their terminations combine into a strong pointed rostrum. In this case we have a gradual modification, depending apparently upon the gradual diminution and final disappearance of solar light. On the other hand, *Munida*, from equal depths, has its eyes unusually developed and apparently of great delicacy. Is it possible that in certain cases, as the sun's light diminishes, the power of vision becomes more acute, while at length the eye becomes susceptible of the stimulus of the fainter light of phosphoresence? The absence of eyes is not unknown among the Astacidæ. *Astacus pellucidus*, from the Mammoth cave, is blind, and from the same cause — the absence of light; but morphologically the eyes are not entirely wanting, for two small abortive eye-stalks still remain in the position in which eyes are developed in all normal decapods. In *Deidamia* no trace whatever remains either of the eyes of sight or of their pedicels."

OCELLI IN BUTTERFLIES.—Forty years ago, Klug, in a memoir on the occurrence of ocelli in insects, remarked that these organs were not found in butterflies, — "not even in Hesperidæ;" and so far as I know this has been the universal testimony of naturalists. It was therefore, with some surprise, that on removing the scales from the head of *Lerema Accius* ♂, I discovered in the middle of the front, a conspicuous ocellus. Other species were examined with the following result: Ocelli are present in both sexes of *L. Accius*, in the ♂ at least of *L. Pattenii* (no ♀ examined), but in neither sex of *L. Hianna!* I could not find any in the neighboring genera. In the ♂ of *L. Accius* and *L. Pattenii* there is a single ocellus — lenticular and smooth; in the ♀ of the former it is similarly situated, but broken up into three minute raised points, all together equal to the one ocellus of the ♂ and indicating that the latter is composed of three confluent ocelli.

It is not a little remarkable that in other Lepidoptera possessing ocelli, these are always two in number, and situated behind the antennæ, probably (I am unable to examine specimens) upon the vertex. In some Hemiptera, however, the ocelli are found below the eyes, and in others above, so that this feature is not unprecedented. It would scarcely seem as if the position of the ocelli had the same morphological significance as that of the other organs.—S. H. SCUDDER.

ON A HABIT OF A SPECIES OF BLARINA. — I recently placed a water-snake (*Tropidonotus sipedon*) of two feet in length, in a fernery which was inhabited by a shrew, either a large *Blarina Carolinensis* or a small *B. talpoides*. The snake was vigorous when placed in the case in the afternoon and bit at every thing within reach. The next morning the glass sides of his prison were streaked with dirt and other marks, to the height of the reach of the snake, bearing witness to his energetic efforts to escape. He was then lying on the earthen floor in an exhausted state, making a few ineffectual efforts to twist his body, while the *Blarina* was busy tearing out his masseter and temporal muscles. A large part of the flesh was eaten from his tail, and the temporal and masseter muscles and eye of one side, were removed, so that the under jaw hung loose. The temporal was torn loose from the cranium on the other side, and as I watched him, the *Blarina* cut the other side of the mandible loose, and began to tear the longicolli and rectus muscles. His motions were quite frantic,and he jerked and tore out considerable fragments with his long anterior teeth. He seemed especially anxious to get down the snake's throat (where some of his kin had probably "gone before"), and revolved on his long axis, now with his belly up, now with his sides, in his energetic efforts. He had apparently not been bitten by the snake, and was uninjured. Whether the shrew killed the snake is of course uncertain, but the animus with which he devoured the reptile gives some color to the suspicion that he in some way frightened him to exhaustion.—E. D. COPE.

BIRTHS AT THE CENTRAL PARK ZOOLOGICAL GARDEN. — Lion (*Felis leo*). Two cubs born January 25, 1873 (this is the second time that lions have bred on the Park); period of gestation sixteen weeks; the body indistinctly spotted, long black hairs being scattered over the head; born blind.

Lions are more prolific than any other species of Felis; after the first litter the number produced is seldom less than four. It is a well known fact, that these animals breed more freely in travelling menageries than in zoological gardens, the change of air no doubt having considerable influence in producing this result. The Director of the Dublin Zoological Gardens has been more successful than any other Director in Europe in breeding lions. They have never been able to raise young lions in the London Zoological Gardens. Dr. Bartlett, the Superintendent of the Gardens, in a paper read to the Society, says: —

"A very extraordinary malformation or defect has frequently occurred among the lions produced during the last twenty years, in the Regent's Park. This imperfection consists in the roof of the mouth being open. The palatal bones do not meet, the animal is unable to suck, and consequently always dies. This abnormal condition has not been confined to the young of any one pair of lions; but many lions that have bred in the Gardens, and were not in any way related to each other, have from time to time produced these malformed young, the cause of which appears to me quite unaccountable."—W. A. CAMDEN, *Director*, *Central Park Menagerie.*

GENERATION OF EELS (ANGUILLÆ).— This is a subject that has occupied the attention of naturalists from the earliest dawn of Ichthyology; and its importance, both in a physiological and economical point of view, has always been, and still is recognized. Yarrell, in Jesse's "Gleanings in Natural History," and in the second edition of the "History of British Fishes," Vol. 2, p. 388, expresses his belief, as the result of a close examination of a number of eels, that they are oviparous, producing their young like other true bony fishes; and he refers in support of this opinion, to some Hunterian drawings, on a magnificent scale, by Clift. Dr. Mitchell, too, of New York, coincides strictly with Yarrell. Though hermaphrodites in fishes have hitherto been supposed to occur only abnormally, as in the genus Serranus, they may perhaps be more common and regular than is admitted in the books of comparative anatomy, such as that of Owen, wherein fishes are said to be always diœcious. But now an Italian physiologist, G. B. Ercolani, in the Proceedings of the "Accademia delle Scienze di Bologna," of last December, describes "Perfect Hermaphroditism in the Eel;" the genitals only completely developed at sea during the month of December; ovaries and testes then and there with spermatozoa; and, as he believes, the spermatozoa are discharged into the peritoneal sac, and the ova there fertilized before their emission from the body. This is surely an interesting statement, and in conformity with many facts well known regarding the economy of the eel. But it requires confirmation, and indeed the subject is so very curious and important, that it is to be hoped that ichthyologists on the seacoast will pursue the inquiry to its legitimate conclusion.—*Land and Water.*

ANATOMY OF THE KING CRAB.—M. Alphonse Milne-Edwards finds that the circulating apparatus of Limulus is more perfect and complicated than that of any other articulate animal. The venous blood, instead of being diffused through interorganic lacunæ, as in the crustacea, is, for a considerable portion of its course, enclosed in proper vessels with walls perfectly distinct from the adjacent organs, originating frequently by ramifications of remarkable delicacy, and opening into reservoirs which are for the most part well circumscribed. The nutritive liquid passes from these reservoirs into the branchiæ, and, after having traversed these respiratory organs, arrives, by a system of branchio-cardiac canals, in a pericardiac chamber, then penetrates into the heart, of which the dimensions are very considerable. It is then driven into tubular arteries with resistant walls, the arrangement of which is exceedingly complex, with frequent anastomoses, and of which the terminal ramifications are of marvellous tenuity and abundance. He has also found, as Prof. Owen had intimated, that the nerves are completely ensheathed by the blood vessels.— *Annals and Mag. Nat. History*, *Feb.*, 1873.

THE ROSE-BREASTED GROSBEAK (*Goniaphea Ludoviciana*).—I wish to testify to the benefits this bird confers by destroying the "Colorado Potato Bug" (*Doryphora decem-lineata* Say), cutworms, and other insects. I have often seen the birds feeding in company with robins, bluebirds, orioles, tanagers and other birds, in various parts of the state, where they appear to be abundant, particularly in spring. They frequent open timber, fields and ploughed lots away from travelled roads. Their note resembles that of the scarlet tanager; when flying, the white on the wings causes them to look something like the red-headed woodpecker. I have never known them to eat green peas, as Mr. Allen says that the black-headed grosbeak, their nearest ally, does. — HENRY H. MAPES, *Kalamazoo*, *Michigan*.

CANARIES NESTING.—Confined by illness I have for several days watched a pair of canaries making their nest. They are now lining it, using feathers for that purpose, a portion being from their own bodies, though not (I think) purposely detached. The rest are feathers which I have put on the bottom of the cage. I was struck with this observation, that every time a feather was taken to the nest, it was first deliberately dipped into the water cup, then put in its place, when the building bird, most frequently the female, would drop into the nest and then wriggle the body, to give shape to the structure. The soaking of the feathers was evidently a matter of design, namely, to cause them to lie in place, and receive the proper bend from the motion of the bird's body. I think this indicates considerable intelligence in these little pets.—S. LOCKWOOD, *February* 14.

AN AQUATIC BOMBYCID MOTH. — Mr. Bar of Cayenne has forwarded to the Entomological Society of France, descriptions and specimens of the various stages of an interesting Bombycid. The larva lives under stones in streams and rises to the surface for transformation. The cocoons are found in clusters floating on the water. Aquatic caterpillars have hitherto been known only in the lower families of Lepidoptera.

THE EDUCATION OF APES. — The following query comes from a "layman," but is worth considering:—

"Suppose a man whose wealth corresponded with his love for scientific investigation, or some liberal institution or government in his place, should commence the following experiment, viz.; the careful education of a family of the most intelligent apes, through generation after generation, with a view of determining whether such a system would result in an increased development of brain, both in size and quality, and in the retention by one generation of knowledge acquired by a former. Of course this must be done in the native land, in a climate adapted to them, and with extreme and constant care, and the result in the life-time of one man might be hardly perceptible. Would not such an experiment, however, be of immense consequence to science however it might result?"

FAULTY INSTINCT IN A CAT.—Having ended some incomplete studies last summer on a pine snake, it became a question how to dispose of it for the winter, so as to have it in condition for renewed observations at the returning season. This was done thus. Its box was neatly covered, and converted into a flower stand, so that in blissful ignorance our lady visitors were not horrified, when admiring the sitting room flora, with any suspicion of a terrible "snake beneath the flowers."

We have a cat, which, already adult, was brought from "The Pines," and doubtless had a knowledge of snakes, probably both by inheritance and acquaintance. Yesterday, March 2d, the reptile set up its peculiar blowing in its dark box. It was a sight to observe the actions of the cat. There was plainly astonishment in that feline pate. She kept her place, turning her head towards the several corners of the room, and listening intently. Still continued that strange blowing of the snake, like a loud wheezing of wind escaping from a rent in a great forge bellows. The cat now fixed her eyes on the box whence the sound came. It happened that a strip of dark colored cloth lay on the box, with a part pendent to the floor. Pussy's mind was made up—that was a snake—nothing surer, for the sound kept steadily coming from that very spot. Now the cat crouched low and crept very slowly indeed, with eyes riveted on the prey. Still the reptile hissed and the cat slowly advanced. Now came a pause of but a second, and the beast sprang seizing the pseudo-snake. There was an attempt at a shake; but its illusion had vanished. Such a look of silly astonishment and feline disappointment as followed cannot be described. All that can be said is, this new experience had its manifestation. As sometimes with other hunters, pussy's prey was not worth the powder, and she turned away in disgust. The exact nature of her perplexity we cannot know; for still the hissing was kept up. Although decidedly at fault in its attack on the strip of cloth, yet this whole affair seems to me a case of awakened instinct. It is a year and a half since she has been here. How much of recollection of individual knowledge, or experience; and how much of awakened inherited habit, or instinct, and what the concatenation of these things might be in that feline thinking, are perhaps problems to be referred to some future metaphysicist in zoology. One curious habit of this cat deserves mention. Her cry, whether caused by want of food or any other attention, is exactly that of our American puma (*Felis puma* Shaw) popularly known as the panther or painter. I have heard the female puma's cry so piercing and distressing, and the likeness is so close, that the sound of pussy's cry is positively annoying to me. The difference between them is entirely one of loudness. Even the very timbre, or quality of tone is identical. The cat is black and white and in disposition as gentle as others, even showing affection. I ought to say that when a kitten she was a favorite of my lamented friend, that accomplished botanist, the late Dr. P. D. Kineskern, and even in the pains of his departure her kitten gambols on his bed entertained that good and excellent man, who is known in posthumous fame as the philosopher of the Pines.—SAMUEL LOCKWOOD.

VARIATION IN DENTITION.—Mr. Allen and others may be interested in a case showing that even the dental formula, so universally employed in framing generic and higher groups of mammals, is variable, and therefore not always reliable. In the skull of a wolf (*Canis lupus* L., race *occidentalis* Rich., strain *griseo-albus* Bd.,) I find the dentition not only anomalous, but also asymmetrical; there is a supernumerary tooth on the right side of the lower jaw. The extra tooth is a molar behind the last true molar, making three teeth back of the large sectorial one. It is small (about as much less than the last true molar as this one is less than the penultimate), but well developed, single-rooted, circular, very obtusely conical. There is nothing to meet it above, since it sets entirely back of the upper series. On the other side of the under jaw there is a slight pit in the bone, corresponding to the situation of the extra molar, and showing an ineffectual *nisus* in the same direction. In all other respects the dentition is normal. To judge from a limited experience, this is an uncommon anomaly; I have never before met with it in a feral animal. The preparation (No. 2,728 of the writer's coll.) goes to the Smithsonian. —ELLIOTT COUES, *Fort Randall*, *Dakota*.

HOW TO CLEAN THE EUPLECTELLA.—This beautiful sponge is becoming a favorite, and deservedly, with lady collectors. Its marvellous delicacy and purity, after long exposure without a glass shade, becomes sadly injured by the adhering dust. I had a specimen given me lately, which, from this cause had become so unsightly as to be accounted worthless. I filled a deep jar with water, and stirred into it a good table spoonful of chloride of lime. An hour or so was then given for the lime to settle. After this, the specimen, held by a clean thread, was suspended in the fluid for twelve hours or so. It was then taken out by the thread, and suspended a few hours in clean water. This entirely removed the chlorine. It was then suspended in the air to dry, after which it was of immaculate whiteness, and sparkled like the frosted snow.—S. L.

WOODPECKERS TAPPING SUGAR TREES.—Upon the Iowa University campus we have a number of grand old aboriginal oaks, a favorite resort for redheaded woodpeckers (*Melanerpes erythrocephalus*). Among the young and growing trees that have been transplanted upon the campus are some sugar maples (*Acer saccharinum*) the bodies of which are six or eight inches in diameter. Seeing the woodpeckers busily tapping upon them I examined the trunks and found them perfectly sound, but the birds had pierced many holes, of the usual size, through the bark and into the cambium layer, where they stopped. The sap was flowing freely from the holes, and, watching the movements of the birds afterward upon the trees, I became convinced that they were sucking the sap and that they had pecked the holes for the purpose of obtaining it. This habit is probably not new to ornithologists, but I am not aware that it has before been noticed.—C. A. WHITE.

THE WHITE-RUMPED SHRIKE.—In a residence of two years in central and southern Iowa, I killed a large number of shrikes, and although the greater number were plainly referable to *Collurio excubitoroides*, there were some that I could not satisfactorily place as belonging either to *C. excubitoroides* or *C. Ludovicianus*,—they seemed to be intermediate between the two; generally nearer the former than the latter. Occasionally an individual would agree very nearly with Baird's description of *C. Ludovicianus*, though without undoubted specimens of the latter bird from the southern states, I was unable to decide whether they were absolutely identical, or in what the difference consisted. I mention this fact to show that, while occasional observations, or observations for a limited space of time, would probably result in the conclusion that *C. excubitoroides* was the only form, close and extended observation would show a strong variation in many cases toward the *C. Ludovicianus* type, while rarely a specimen would be found that would appear to be absolutely of that species. Nevertheless, the typical *excubitoroides* is the predominating, and by far the commonest, form; nor could I observe anything in the habits of the birds pointing to two species or even well-defined varieties; birds mated together sometimes showing considerable differences of plumage.—T. MARTIN TRIPPE, *Orange*, *N. J.*

TADPOLES IN WINTER.—An esteemed contributor sends us an account of tadpoles that were found early this spring, having passed the winter in that condition, which he considered as perhaps a case of arrested development. It is however well known that the large bull frog (*Rana pipiens*) is (at least in the New England States) two or three years in the larval or tadpole condition, and if retained in a tank and forced to keep up its fish-like life there is no knowing how long the larval state would be retained. The experiments made by Prof. Wyman several years since resulted in keeping the tadpoles for a number of years, and at the end the water was accidentally let out of the tank. If any one will take the trouble of trying the experiment it will probably be found that unless the tadpoles are allowed a chance to hop along shore about the time their legs are developed, they can be greatly retarded in obtaining their perfect form as frogs or toads. Many of our New England species of frogs and toads develop very rapidly, passing through the tadpole condition in a week or two, while others are naturally much longer in making the change, and probably both *Rana fontinalis* and *Rana pipiens*, and perhaps other species, require to pass one or two winters in the tadpole state.—F. W. P.

THE GOLDEN-WINGED WOODPECKER.—In his "Notes of an Ornithological Reconnoissance of portions of Kansas, Colorado, Wyoming, and Utah," J. A. Allen speaks of specimens of *Colaptes auratus*, taken in eastern Kansas, showing a tendency to the coloration of *C. Mexicanus* in having the "black maxillary patch, more or less tinged with red;" and mentions one from Florida with the same peculiarity. I have observed red feathers in the cheek patches of birds shot at Orange, N. J., in three or four instances; and in one case the black was quite thickly sprinkled with small specks of bright, shining red, more brilliant than that of the nape. Here we have an instance of occasional individuals of one species exhibiting a tendency to vary in the direction of a congeneric species, not occurring within fifteen hundred miles of the former.—T. MARTIN TRIPPE, *Orange, N. J.*

ORNITHOLOGICAL QUERIES.—I wish to make two or three ornithological queries through the pages of the NATURALIST. What are the southernmost localities in which the following species are known to breed? viz.: *Regulus satrapa*, *R. calendula*, *Anorthura hyemalis*, *Junco hyemalis*, *Plectrophanes pictus*, *P. Lapponicus* and *P. nivalis?* What is the eastern limit of *Vireo Belli?* and what is the southern and southwestern range of *Pediœcetes phasianellus?* I am very desirous of obtaining information on these points.—T. MARTIN TRIPPE, *Orange, N. J.*

MODE OF EGG-LAYING OF AGRION.—Mr. G. W. Dunn writes us that while collecting at Santa Cruz, California, he observed a species of Agrion (as we find the insect to be) "flying about the water united male and female. The female would light on a spear of grass growing in the water; the male would then let go, and the female go down the grass twelve or fifteen inches under water and deposit her eggs."

HABITS OF MONOHAMMUS DENTATOR.—On the 9th of June, 1872, my attention was directed to a yellow pine (*Pinus mitis*) abou fifty feet high and twelve inches in diameter, in which several holes about the size of a pencil were to be seen at various points on the trunk.

On removing the bark I found an adult insect already free and the heads of several others appearing through the wood. On further investigation during the next few weeks I obtained from the tree no less than eighty of these beetles in all stages of develop ment, which, considering the size of the tree, was a large number. I observed that the largest beetles were near the foot of the tree, and that the larvæ almost invariably avoided a knot on account of the hardness (?) of the wood. Where the diameter of the tree was about six inches the larvæ would bore through the trunk instead of making only a surface bore as they did where the diameter was greater.

The larva is a footless, yellowish white grub, more or less hairy, cylindrical in shape, and about one and four-tenths inches long, and three-twentieths of an inch in diameter. The body including the head is made up of fourteen segments, the last eight of which have a kind of ridge on each side, covered with hairs longer than those which are found on the rest of the body and which doubtless assist it in locomotion, the second segment next the head is flattened on the upper side. On both the upper and under sides of the body are seven raised rough spots at right angles with the ridges on the sides. It feeds on the sap wood or inner bark until autumn, when it turns aside and bores outward leaving its passage filled with chips. Within the distance of from one-half to one-tenth of an inch from the bark it forms a smooth, hollow, curved excavation about the size of an almond in which it undergoes its transformations during the winter or even as late as the last of June.

The pupa is white and varies in size from three-fourths of an inch, to an inch and one-tenth. In this state it resembles the imago, the only difference being that the elytra are not developed.

After remaining in the pupa state during a space of time which varies according to circumstances it is transformed to a beetle and after a short time gnaws its way out, appearing from the first of June to the middle of July. The imago is brownish, mottled with gray, black, and cream color, and varies in size from three-fourths, to something over an inch in length. The two sexes differ in the great length of the antennæ, which in the male are full twice the length of the body, and in the development of the anterior tarsi, which in the male are much broader than in the female. It is unnecessary further to describe the imago as in this state the dentator is well known. I have only taken these beetles in Massachusetts but have found traces of them in Connecticut and in northern New York, whence it can be inferred that they inhabit all New England. — F. C. Bowditch.

The Painted Bunting.—The *Plectrophanes pictus* visited southern Iowa last fall in great numbers, appearing toward the close of October, but whether it is as abundant every season I cannot say, but am inclined to think that it was far more common than usual, as was the case with almost all northern birds. In its habits it was very similar to the Lapland longspur, but differed in being less gregarious, frequently feeding singly or in small parties of five or six, which the latter bird seldom does, and in showing a partiality for wet meadows and moist low-lying prairie swales, while the longspur prefers the cornfields and higher ground, as a rule, and does not appear until some weeks after *pictus*. The notes and flight of the two species are quite similar, though distinguishable.—T. M. Trippe, *Garden Grove, Iowa.*

New North American Hymenoptera. — The last number of the Transactions of the Academy of Science of St. Louis contains a posthumous paper by the late B. D. Walsh, in which many new species of Tenthredinidæ, and Ichneumonidæ are described.

ANTHROPOLOGY.

Note on a Collection of Skin Scrapers from New Jersey.— Since the publication of our notice of the stone implements found in New Jersey, in the Naturalist for March and April, 1872, our attention has been frequently called to the greater variety of shapes than we then supposed to occur, and to the unusual degree of excellency exhibited in the manufacture of these well known relics. In the paper referred to, we figured four relics as scrapers, each bearing considerable resemblance to the others. In a collection of fifty-four specimens lying before us, we find five types; one of them is the English form, being thin flakes of jasper, of a uniform surface on one side, sloping to either side from a median ridge, and chipped to a bevelled edge in front. The three specimens bear considerable resemblance to those fig-